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1 Hose Clamping Device

a 2 *Background of the Invention*  
3 the present invention relates to a device for securing  
4 hoses, particularly those used by fire fighters.

a 5 *The Relevant Technology*

6 When fighting a fire there are a number of problems to be  
7 addressed in addition to extinguishing the fire, for  
8 example rescuing those who are trapped or crowd control.  
9 As a result the available human resources need to be  
10 carefully targeted to limit/prevent the occurrence of  
11 injury.

a 12 *Brief Summary of the Invention*

13 The present invention recognises that as part of fire-  
14 fighting the use and control of a hose is an onerous task  
15 requiring the efforts of several people. The present  
16 invention attempts to mitigate this problem and allow for  
17 better targeting of available resources.

18  
19 It is an object of the present invention to provide a  
20 device whereby a hose can be clamped to a support thus  
21 allowing fire fighters to be released from such duties  
22 and available for other tasks, for example rescuing those  
23 who are trapped.

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1 It is a further object that such a device will be simple  
2 to use and readily adapted to the dimensions of different  
3 hoses.

4

5 According to the present invention there is provided a  
6 universal hose clamp comprising a universal hose locating  
7 mechanism, a hose coupling for connecting a hose to the  
8 hose clamp, and a securing means for securing said  
9 locating mechanism to a support structure.

10

11 Preferably the support structure is an existing railing,  
12 pole or other similar structure.

13

14 Preferably the securing means is a universal base  
15 clamping mechanism adapted for clamping onto the support  
16 structure.

17

18 Alternatively the support structure is a portable  
19 independent frame.

20

21 More preferably the portable independent frame is a  
22 tripod.

23

24 Preferably in this second embodiment the securing means  
25 is a locking mechanism adapted to lockably engage the  
26 hose locating mechanism to the support structure, wherein  
27 the locking mechanism comprises a male and female member  
28 that are adapted to lockably engage.

29

30 Preferably the hose locating mechanism comprises a  
31 central mount, two Azimuth locking mechanisms and a quick  
32 release hose mount.

33

FOOTNOTES

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1 More preferably the Azimuth locking mechanism contained  
2 on the locating mechanism comprises a handle assembly, a  
3 connection means and a stab pin.

4

5 Preferably the Azimuth locking mechanism contained on the  
6 locating mechanism moves between an unlocked position  
7 when the handle assembly is in a plane parallel to the  
8 stab pin, and a locked position when the handle assembly  
9 is rotated through 90 degrees to lie in a plane  
10 perpendicular to the stab pin.

11

12 Preferably the first Azimuth locking mechanism contained  
13 on the locating mechanism provides a means for rotating  
14 the hose coupling about an axis in the horizontal plane.

15

16 Preferably the second Azimuth locking mechanism contained  
17 on the locating mechanism provides a means for rotating  
18 the hose coupling about an axis in the vertical plane.

19

20 Preferably the hose coupling comprising a gripping aid, a  
21 mounting band and a securing means.

22

23 Preferably the gripping aid is cylindrical in shape.

24

25 More preferably the gripping aid is made of a flexible  
26 material, namely rubber.

27

28 Preferably the mounting band is cylindrical in shape.

29

30 Preferably the securing means is a screw thread mechanism

31

32 Preferably the attachment means for the hose coupling to  
33 the universal hose clamp is easily detachable.

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1 More Preferably the attachment means is by way of an  
2 Azimuth locking mechanism.

a

3 *Brief descriptions of the drawings*

4 In order to provide a better understanding of the  
5 invention embodiments will now be described by way of  
6 example only with reference to the accompanying Figures  
7 in which:

8

9 Figure 1 illustrates a universal hose clamp for  
10 locking and securing a hose;

11

12 Figure 2 illustrates a component of the  
13 universal hose clamp, namely a universal hose  
14 locating mechanism, with two Azimuth locking  
15 mechanisms shown in a locked position;

16

17 Figure 3 and 4 illustrate separate perspective  
18 views of a further component of the universal  
19 hose clamp, namely a universal base clamping  
20 mechanism shown clamped to a Y-shaped handrail;

21

22 Figure 5 illustrates the universal hose clamp  
23 of Figure 1 one of the universal Azimuth  
24 locking mechanisms for controlling the hose  
25 clamp rotation about the vertical axis in the  
26 unlocked position; and

27

28 Figure 6 illustrates a tripod on which the  
29 universal hose clamp of Figure 1 can be  
30 mounted;

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a Detailed description of the ~~drawings~~ Preferred Embodiment

1 Referring initially to Figure 1, a universal hose clamp  
2 is generally depicted at 1 comprising a universal hose  
3 locating mechanism 2, a universal base clamping mechanism  
4 3 and a hose coupling 4.

5

6 The hose coupling 4 comprises a cylindrical gripping aid  
7 5, a cylindrical mounting band 6 and a screw thread  
8 mechanism 7.

9

10 Figure 2 illustrates further detail of the universal hose  
11 locating mechanism 2 in the absence of the base clamping  
12 mechanism 3 and the hose coupling 4. The hose locating  
13 mechanism 2 comprises a central mount 8, two Azimuth  
14 locking mechanisms 9 and 10 and a quick release hose  
15 mount 11.

16

17 The two Azimuth locking mechanisms 9 and 10 further  
18 comprise a handle assembly 12, a connection means 13 and  
19 a stab pin 14 or 15. The connection means 13 provides  
20 the activation mechanism for moving the Azimuth locking  
21 mechanisms 9 and 10 between their unlocked and locked  
22 positions. In Figure 2 both locking mechanisms 9 and 10  
23 are in their locked positions. When unlocked the first  
24 Azimuth locking mechanism 9 allows rotation of the hose  
25 mount 11, and hence the hose coupling 4, about a  
26 horizontal axis while the second Azimuth locking  
27 mechanism 10, when unlocked, allows rotation about a  
28 vertical axis. It should be noted at this point that  
29 these two mechanisms lock independently of each other  
30 such that one may be in the locked position while the  
31 other is in the unlocked position. The stab pins 14 and  
32 15 p for the Azimuth locking  
33 mecha

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1  
2 Figures 3 and 4 present further detail of the universal  
3 base clamping mechanism 3 in the absence of the hose  
4 locating mechanism 2. The base clamping mechanism 3  
5 comprises a central frame 16, a rail clamp 17 and a  
6 female 18 for the Azimuth locking mechanism 10. The rail  
7 clamp 17 further comprises a swing over lock 19, a rail  
8 clamp tightening assembly 20, and two threaded locating  
9 rails 21.

10

11 The combination of the hose locating mechanism 2 and the  
12 base clamping mechanism 3 is achieved by inserting the  
13 stab pin 15 in the female locking component 18 with the  
14 handle assembly 12 in the unlocked position, as in Figure  
15 5. This unlocked position corresponds to the case when  
16 the handle assembly 12 is in a plane parallel to the stab  
17 pin 15. The locked position is achieved by rotating the  
18 handle assembly 12 through 90 degrees such that the  
19 handle assembly 12 now lies in the plane perpendicular to  
20 the stab pin 15, as in Figure 1.

21

22 To employ the universal hose clamp 1, the base clamping  
23 mechanism 3 is attached to a railing, pole or other  
24 similarly reinforced structure. As shown in Figure 1,  
25 the desired structure to which the hose clamp 1 can be  
26 attached may take the form of a Y-shaped rail 22.  
27 Initially the swing over lock 19 is opened by unscrewing  
28 one of the threaded locating rails 21. This allows the  
29 rail clamp 17 to be placed in situ around the hand rail  
30 22. With the hand rail 22 in place above the threaded  
31 locating rails 21, the swing over lock 19 is then closed  
32 and fastened. The base clamping mechanism 3 is then

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1 secured in place by tightening of the rail clamp 17 by  
2 use of the rail clamp tightening assembly 20.

3

4 The second stage is to attach the hose locating mechanism  
5 2 to the base clamping mechanism 3 via the vertical  
6 Azimuth locking mechanism 10 as described above.  
7 Thereafter the hose (not shown) is inserted within the  
8 cylindrical hose gripping aid 5 which is then tightened  
9 in the cylindrical mounting band 6 that is attached to  
10 the quick release hose mount 11. The tightening of the  
11 cylindrical hose gripping aid 5 in the cylindrical  
12 mounting band 6 is achieved via the screw thread  
13 mechanism 7. With the horizontal Azimuth locking  
14 mechanism 9 in the unlocked position the hose coupling 4  
15 is mounted on the horizontal stab pin 14.

16

17 At this stage the hose is secured within the hose clamp 1  
18 and can be deployed at full pressure by just one person.  
19 This has the obvious advantage of releasing manpower to  
20 carry out other important duties. By simply unlocking  
21 either of Azimuth locking mechanisms, 9 and 10, the hose  
22 can be rotated to provide universal cover over  $4\pi$   
23 steradians.

24

25 Mobility for the hose coupling 4 may be enhanced by its  
26 incorporation with a tripod system 23, as illustrated in  
27 Figure 6. This tripod 23 comprises a female member 24  
28 for use in an Azimuth locking mechanism 10, adjustable  
29 legs 25 and a cross brace 26 to provide additional  
30 strength. It should be noted that the aforementioned  
31 female 24 is of a similar design to the female member 18  
32 used in the previously described embodiment. Therefore,  
33 there is no requirement for the modification of the hose

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1 locating mechanism 2. With this embodiment the tripod is  
2 assembled at the required location. The hose (not shown)  
3 is then mounted in the hose locating mechanism 2 as  
4 previously described. The vertical stab pin 15 is then  
5 inserted in the female of the tripod 18 and locked as  
6 required by the vertical Azimuth locking mechanism 10.

7

8 The use of alternative hose diameters is determined by  
9 the nature of the emergency. Thus the hose coupling 4 is  
10 not limited to use with one particular hose size.  
11 Selection of a hose can be accommodated within a  
12 particular cylindrical gripping aid 5 by the adjustment  
13 of the screw thread mechanism 7. If the hose diameter is  
14 significantly different then the quick release hose mount  
15 11 allows a second hose clamp 4 of the desired dimensions  
16 to be quickly mounted on the hose locating mechanism 2.

17

18 An advantage of the present invention is that there is  
19 provided a universal hose clamp which can be used with  
20 known types of hose and whose parts are readily  
21 interchanged to meet the requirements of different  
22 emergency situations.

23

24 A further advantage of the present invention is that  
25 there is provided means which will reduce the manpower  
26 required to control a hose, and increase the numbers  
27 available to help those who are part of the emergency  
28 situation.

29

30 A further advantage of the invention is that the  
31 individual securing means are able to rotate such that  
32 the hose can be used in any direction thus allowing the  
33 changing needs of an emergency situation to be met.

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1  
2 In an alternative embodiment the clamp may be provided  
3 with means to enable control from a remote source. For  
4 example an electronic receiver and control electronics  
5 could be mounted within the central mount 8 of the  
6 universal hose locating mechanism 2. This would allow  
7 the direction of the hose coupling 4 to be altered  
8 without the requirement for direct human contact.

9  
10 Further modifications and improvements may be added  
11 without departing from the scope of the invention herein  
12 intended.

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